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This paper compares traditional letter and email correspondence sent to the Reference Department at Duke University's Perkins Library to analyze the effects of email on reference correspondence. A random sample was taken from traditional letter correspondence from 1962 to 1978 and email correspondence from 2000 to 2003. The analysis focuses on the changes in demographics, content, and interactions revealed in the two types of correspondence.

The study finds that email has significantly affected academic reference service. The statistics for gender, location, and affiliation of correspondents have significantly changed. The content of reference correspondence has also been altered as email questions have become more limited in scope than questions posed in traditional letters. The types of interactions between correspondents and reference librarians have not significantly changed with the use of email. Academic institutions should expect increased demands for remote reference assistance. By building on the lessons of the past, librarians can create an email service where people can ask questions, be treated with respect, and be given access to information with the use of appropriate resources.

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THE EFFECTS OF EMAIL ON AN ACADEMIC LIBRARY'S REFERENCE SERVICE

by
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Introduction

Academic reference librarians have provided reference services to users by correspondence as a standard component of public service for many decades. The emergence of the Internet in the 1980s and its growth and acceptance during the 1990s have brought tremendous changes to the services provided by reference librarians. Today, email offers many new opportunities for providing services to library users. The use of email and the Internet has changed the whole concept of "remote" to mean something that is much more accessible. With the use of the Internet, information and potential answers to reference questions may be more quickly available and more easily transmitted. This shift may have affected who uses remote reference, what types of questions are asked, how users and reference librarians interact, and how librarians search.

In this time of great technological change, the library's traditional missions to provide access to information and high quality service are still relevant. Librarians are needed more than ever before to help users navigate the tremendous amount of available information and to humanize the process of computer-mediated communication.

The American Library Association (1979) defines reference service as a transaction "of personal assistance provided to users in pursuit of information…that… specifically ensures the optimum uses of information resources through substantive

interaction with the users on direct and indirect levels" (p. 275). This belief that the reference librarian is the intermediary between a growing store of information and the user continues to be strong (Moore, 1996). The concept of individual personal service is an important element of both written correspondence and email.

The Internet has changed the way students and scholars do research. According to Doran (1996), before the use of computers, people followed a linear approach to searching. Topics and sources were examined sequentially and their formats and locations were fixed. The use of the World Wide Web and the on-line catalog allows searching in many directions at the same time. People's expectations for how quickly information should be accessible have also changed. A computer's ability to retrieve and process information rapidly has raised people's expectation to find answers quickly and on-line. The changes in expectations and attitudes have affected both librarians and users.

Email, as a means of communication, is a quick and efficient method of exchanging information. It offers significant advantages for reference correspondence in academic libraries. Email is convenient to use since a question can be asked at any time and provides 24-hour access to the library without the significant cost of extending library hours. Its format allows for easy referral to the most appropriate librarian. Email can reduce barriers since a user does not have to approach a reference desk, use the telephone, or wait days or weeks for a letter traveling through the mail. There is the opportunity to create a database for frequently asked questions. Email can offer satisfying information to a user for a relatively small commitment of time and labor (Stanley & Lyandres, 2001; Schneider, 2000; Schilling-Eccles & Harzbecker, 1998;

Bushallow-Wilbur, DeVinney, & Whitcomb, 1996). Eileen G. Abel (1996) points out that email is considered "less formal, more spontaneous, and more ephemeral" (p. 349) than traditional mail.

Electronic reference, in general, can also be good for public relations. It demonstrates to users that the library wants to make itself available in every way. It appeals to users who like to use computer-based tools. According to the Association of College and Research Libraries (1997), remote library users are entitled to the same services and resources provided for students and faculty in traditional campus settings. Libraries with up-to-date electronic services appear to be on the cutting edge of information services.

Email also offers distinct challenges to the reference process. (Stanley & Lyandres, 2001; Schneider, 2000; Schilling-Eccles & Harzbecker, 1998; Bushallow-Wilbur, DeVinney, & Whitcomb, 1996). Email does not provide any aural or visual feedback to the user or the librarian. Requests often contain minimal information. The speed of the email and the Internet can lead users to ask quick questions and to expect instantaneous responses. Academic librarians may receive questions that would be better directed to a user's local library. With the recent inception of email reference services, there are few agreed upon rules of etiquette. Spelling errors and poor grammar are commonplace in email letters. Schilling-Eccles and Harzbecker (1998) studied the use of email service at the Boston University Medical Center Library and discovered that lack of computer access, inconvenience, and lack of personal contact were barriers to users. All of these aspects can make it more difficult for a librarian to determine a user's needs with accuracy.

This study will analyze and compare the correspondence received by letter and by email at the Reference Department at Duke University's Perkins Library. The libraries of Duke University are comprised of the William R. Perkins Library and its seven branches. As of June 30, 2002 these libraries contained over 5.2 million volumes and have an annual materials budget of more than twelve million dollars. In addition, the collection includes eleven million manuscripts, and over two million public documents (Bryan, 2000).

Perkins Library, the central library in the Duke University system, was opened in 1930. It now houses books, journals, and online resources supporting the humanities and social sciences, as well as a large collection of United States federal and state documents. The library is a depository for United States, North Carolina, and European documents.

The Reference Department was formed in 1937 and started with an initial staff of three librarians. Today, eighteen people share responsibilities for staffing the desk and answering reference questions. The Reference Department offers a wide variety of services to people affiliated with Duke University. Librarians help find information on specific topics; develop search strategies for research papers; search catalogs, databases, the Web, and indexes; locate facts and statistics; answer questions about the services and resources of the Duke libraries; provide instruction on the use of the library and the Internet; and maintain hundreds of the library's Web pages. From July 2000 to June 2001, the Reference Department completed 31,282 reference transactions.

Traditional mail correspondence was kept by the Reference Department from July 1962 to December 1978 and representative letters were kept from 1979 to 1982. These letters are available for study. The "Ask a Librarian" site, a Web-based reference service

at Askref@duke.edu, began in 1995. These email records are available from 2000 to the present.

There have been a number of studies on the use of email reference service in libraries. However, there are no studies that compare written and email correspondence. There is no literature that examines the content of written correspondence to an academic library from a user's perspective and analyzes the interaction between the correspondent and the reference librarian. My study is unique because it compares pre- and post-Internet access within the same academic library with detailed records from both eras.

Reference librarians need to prepare for the future and anticipate how technology will change the use of their services. A more in-depth analysis of the correspondence could help reference librarians understand the trends that now affect remote inquiries. An understanding of the library's users may help academic institutions plan policies that would provide more effective reference and outreach services. By examining the correspondence from users of the Reference Department, I hope to help reference librarians understand some of the changes brought about by the use of computer-mediated communication.

Literature Review

Scholars have studied a number of different aspects of email correspondence to better understand its use. A survey of the literature reveals a number of studies that have examined the use of the written reference interview, the users of email reference, and the types of questions asked. These studies describe current systems or give suggestions about how particular aspects of library service might be improved.

Studies of the Email Reference Interview

One advantage of email over a letter is the opportunity email offers for a written reference interview. Email lacks the visual cues of a traditional interview but email queries do not have to be taken literally since questions may be quickly clarified. This offers a distinct advantage over traditional mail. Helen R. Tibbo (1995) postulated that electronic mail provides opportunities for good communication between client and archivist. Email offers time for reflection and inquiries can be answered fairly rapidly without the frustration of missed telephone messages or the slowness of ordinary mail. The effectiveness of the remote reference interview depends on the librarian's ability to set the tone of the exchange and to clarify the user's questions and needs. Email offers the opportunity to quickly deliver the required information and to follow-up to determine user satisfaction. Tibbo concluded that email offers an interactive means of

communicating with remote users and can combine some of the best qualities of written communication and face-to-face reference service. These conclusions are based upon literature reviews and certainly offer a benchmark to which reference librarians can strive.

Eileen G. Abels (1996) revealed the difficulties of conducting an effective email reference interview in a study of the email reference process at the College of Library and Information Services at the University of Maryland. The three-phased project began with student intermediaries working on-line with student clients to answer real reference questions. Abels concluded that the most effective approach to a reference interview was to use a systematic way of responding that posed all related questions in an organized manner. Substantive reference questions can be successfully negotiated electronically when a systematic approach is used to conduct the reference interview but requests that lack specificity and require extensive negotiation are better suited to verbal communication. As a result, a prototype of a remote request form was designed that consisted of three sections: personal data, subject to be searched, and constraints on search results.

In this study, Abels arrived at logical conclusions but her research methods are somewhat questionable. Her use of college students as librarians and clients, to simulate email reference interviews, was not a realistic recreation of a reference service at an academic library. Not all of the interviews were conducted using email so the results were not consistent. Too many variables were present in each phase of the experiment.

Tibbo (1995) and Abels (1996) studied the mechanics of email reference and made suggestions as how to improve its implementation. Their methods revealed the

need for more in-depth research to reveal how libraries can design systems that account for the information seeking patterns expressed in email reference requests and how to build a good interview into the process so that users' needs are understood.

Studies of Email Users

A number of studies have examined email reference questions to determine the specific types of questions asked and who asks questions electronically. Bushallow-Wilbur et al. (1996) studied the use of electronic mail reference service in three units at the State University of New York at Buffalo to determine patron demographics and question classification. Naomi Lederer (2001) analyzed two years of Colorado State University's email letters for numbers, types of questions, who sent the question, and to whom the question was sent. (A summary of how these studies coded email reference questions is given in Appendix A.) All of these studies traced the evolution of email reference during the 1990s and clarified some of the early questions about its use.

The development of new computer technology saw a lag between its inception and its accepted use. This was also true of the use of email for reference correspondence. Ann Bristow (1992) examined email reference service at Indiana University to see why the service was not thriving. Then, Bristow and Buechley (1995) re-examined the same department three years later and discovered that the types of questions remained constant but the number of users doubled. This phenomenon has been observed in academic libraries throughout this country as people have integrated the use of computers into their work and methods of communication.

There is also research on the information seeking behaviors of users. This body of research proposes that information seeking is an individual process. In seeking information, an individual is trying to find meanings that fit into what that person already knows (Dervin, 1983). This is a dynamic state of knowledge. The user's level of understanding of the problem changes his ability to articulate his needs. This process is not linear or logical as it incorporates actions, feelings, and thoughts about both process and content. There appears to be a gap between the way a traditional system presents information and the user's ability to use information (Kuhlthau, 1991). Dervin and Nilan (1986) postulated that most studies are defined by a system's needs rather than a user's needs. Since that time, there has been a slow shift as more emphasis has been placed on human interaction in information systems. We are beginning to understand that for a library system to work well, it has to respond to both the cognitive and affective dimensions of a person's information seeking behavior.

Duff and Johnson (2001) examined the content of email messages for clues about how users of archives seek information. They believed the email question, as it is given in the user's own words, is an expression of what the user considers relevant in his search for information. An understanding of these elements and how a user structures his requests will make it possible for libraries to design systems that will guide the user to locate the information that best suits his needs. Duff and Johnson's study analyzed 375 email messages forwarded to them from eleven institutions within a six-month period. They coded questions as to the type of request, the type of information desired, and the information already known. The coding was based on a schema for describing reference questions developed by Grogan at the University College of Wales, Aberystwyth.

Grogan (1992) identified eight types of questions that can be divided into two broad categories: limited help questions and open-ended questions. Duff and Johnson analyzed each category and created a cross-tabulation between the "wants" and the "givens" of each inquiry. This showed what element was most often used to describe each information request. Their study yielded interesting results as the terms people use, when they express a need for information, varied from category to category. For example, a service request included the call number or the title 100% of the time while a citation was given 50% of the time, and the source of the citation was given less that 10% of the time. The research found that people use proper names, dates, places, subject, form, and occasionally events when they pose their queries. The study concluded that an information retrieval system based on users' needs would allow searchers to find information based on these types of terms.

In the 1990s, there were also a number of studies undertaken at archival institutions to better understand users' needs by examining reference questions. Bates, Wilde, and Siegfried (1993), at the Getty Online Project, found that humanities scholars used names of individuals 74% of the time, geographical names 37% of the time, and dates 26% of the time in formulating questions. David Bearman (1989/90) examined archival users' "presentation language" to discern what types of questions were answered, how the answer was used, and the reasons for success. The questions were categorized by type and the elements of each category were also identified. Louise Gagnon-Arguin (1998) looked at complex research-based questions asked at archives in Quebec. The study identified three broad categories of questions: general subject, specific subject, and specific form questions. Each category was then broken down by

element, such as place or date. Karen Collins (1998) studied reference questions asked at two archives with historical photographic collections. Questions were again broken down into categories with their identifying elements. These studies were all conducted at archival repositories and included various methods of communicating needs, not just email or written correspondence. (A summary of how these studies coded reference questions is given in Appendix B.)

Studies of the Interactions Between Correspondents and Reference Librarians

Merriam-Webster's Collegiate Dictionary (1998) defines an interaction as a "mutual or reciprocal action or influence." If a librarian is to not just transfer information but to truly practice a humane profession, the reference interview and the interaction between the correspondent and the reference librarian must rely upon the development of a human relationship, even if it is brief. The development of this relationship and how its interactions are interpreted is an integral part of this study.

A number of psychologists and behaviorists have developed schemes for coding the interactions that occur between members of a group. Robert Bales (1950) developed a scheme for coding interactive behavior called "Interactive Process Analysis." Interaction Process Analysis is one of the most refined and empirically tested methods of observing and analyzing small group processes (Lawson & Bourner, 1997). This coding scheme focuses on categorizing messages into social-emotional areas with positive and negative reactions and task areas for both asking questions and providing information.

Bales identified twelve categories with which to code and record the process of interaction. They are:

1. Shows solidarity: raises others' status, provides help or rewards.
2. Shows tension release: jokes, laughs, or shows satisfaction.
3. Shows agreement: gives passive acceptance, understands, complies, or concurs.
4. Gives suggestion: offers direction while implying autonomy for other.
5. Gives opinion: provides evaluation, analysis, or expression of feeling or wish.
6. Gives orientation: provides information, repetition, clarification, or confirmation.
7. Asks for orientation: requests information, repetition, or confirmation.
8. Asks for opinion: requests evaluation, analysis, or expression of feeling or wish.
9. Asks for suggestion: requests direction, possible ways of action.
10. Disagrees: gives passive rejection, formality, or withholds help.
11. Shows tension: asks for help, or withdraws.
12. Shows antagonism: deflates other's status, defends, or asserts self.

Bales based his categories on his belief that communication follows a 'normal' sequence where questions (categories 7-9) are followed by a group of attempted answers (categories 4-6). The answers are followed either by a positive social-emotional response (categories 1-3) or a negative social-emotional response (categories 10-12).

Bales believed that an equilibrium exists between the first half of the table (categories 1-6) and the second half (categories 7-12). This classification grouped the messages by its phase in the decision-making process:

- Orientation: categories 6 & 7
- Evaluation: categories 5 & 8
- Control: categories 4 & 9
- Decision: categories 3 & 10
- Tension: categories 2 & 11
- Integration: categories 1 & 12

Bales' Interactive Process Analysis has been adapted for use in an extensive number of studies. Schoch and White (1997) developed a variation of Bales' IPA to code the communication patterns of participants in consumer health electronic discussion groups. Their analysis focused on coding messages by problem orientation and by function. Schoch and White's analysis is particularly interesting as it showed that communication behaviors vary according to one's personal involvement with a disease.

Other researchers have used Bales' interaction schema to analyze different types of electronic communications. Rice and Love (1987) investigated the socio-emotional content of computer-mediated communication (CMC) systems. They examined both the nature of communication content and its structure by analyzing transcripts from a computerized bulletin board of a national public computer conference. They concluded that a CMC system involving users who do not otherwise know each other may have a reasonable amount (30%) of socio-emotional content.

Emails and letter correspondence are examples of two person groups. Correspondence may be forwarded to others but the initial contact is usually between two people. Hare, Borgatta and Bales (1965) examined group size in social interactions and defined several unique aspects of "two man groups" (p.501) that are particularly

appropriate to the study of the influence of email on reference service. One major feature is the fact that a group of two can only form a majority if both sides agree on the issue. Each person is under pressure to behave in such a way so that the other will not withdraw. In Hare, Borgatta and Bales' study, the low rates of showing agreement and antagonism and the high rates of asking for information and opinion were equated with the necessity of trying to be persuasive while avoiding evaluative comments.
The interactions between the individuals in the reference process determine the cohesiveness of the relationship between the correspondent and the reference librarian.

The satisfaction a library user has with the reference process is not only dependent upon their satisfaction with the answer they receive but also how pleased they are with their group experience. User studies reveal that participants in a group are more satisfied if they feel included in the discussion, messages include orientation so the interactions stay focused, feedback occurs between group members, there is motivation to contribute to the group, and participants are comfortable with the hierarchy or roles of its members (Marston & Hecht, 1988; Ellis & Fisher, 1994).

Lawson and Bourne (1997) pointed out Bales' scheme is particularly appropriate to the study of short-lived problem-solving groups. This type of problem solving is indicative of the interaction between correspondents and librarians. A mutual understanding of what information is needed and how it may be acquired requires communication from both participants. Once again, the librarian's ability to conduct an effective written reference interview can influence how well these two person groups function.

Conclusions

Studies on the use of email reference service in academic libraries have shown that the coding of email questions is often difficult because of the complexity of the requests, may be defined by a library system's needs rather than a user's needs, and often does not reveal how a user approaches a search for information. A literature review does not reveal any studies that compare written and email correspondence.

There also seems to be a gap in the literature about how email has affected academic reference correspondence and how it may have affected the interaction between the user and the reference librarian. The studies have focused on what communication patterns exist among computer users who participate in listservs or used electronic reference. My research complements these studies as it will attempt to give a historical perspective to how small group communication between staff and correspondents in an academic reference department may have changed over time.

By examining the correspondence sent to an academic reference library, I hope to provide information that will allow reference librarians to better understand some of the changes brought about by the use of email and the Internet. This increase in understanding may help reference librarians better serve their users.

Guiding Questions

My examination of the effects of electronic mail at Duke University Library's reference service was guided by a number of interrelated questions. These questions focus on who corresponds with the Reference Department, what types of information are being exchanged, and what types of interactions occur between the librarian and the correspondent so that information can be shared. These questions are important because they may help elucidate how reference services can be made more effective. For example, it is important for any library to clearly understand who it wants its constituents to be and who actually uses its services. Without this knowledge, a library cannot develop programs and services to meet its mission and cannot accurately measure its effectiveness. A central question for this study is: *How has email affected who writes to the Reference Department to ask a reference question?* Comparisons of gender, affiliation, and location will give a better understanding of who uses this service. *Are men or women more likely to correspond with their questions and has this changed with the use of email? Does proximity affect who uses email reference service? Are more users outside of the United States using email reference since the "Ask a Librarian" service states that mail is checked at least every two hours during business hours?*

Remote access to Duke University's electronic databases is limited by licensing agreements signed with database vendors. Duke University's (2002) policy on remote access states that off-campus access to most library databases and e-journals is available only to current Duke students, faculty, and staff. But, all users of the Internet have access to the "Ask a Librarian" Web page. *What affiliation do the users of this site have with*

Duke University? How do librarians deal with the questions asked by users who are not affiliated with the university?

Email has become the dominant way that users correspond with the Reference Department at Duke University. The number of email questions sent to the "Ask a Librarian" service has risen dramatically in the past few years. In 1999, the Reference Department received 522 email questions. This number compares to 522 email questions received just in the first two months of 2003.

The reference question is the stimulus to the action that occurs in any reference transaction. There are many types of questions asked by remote users but the content of the questions, for the purposes of this study, can be categorized by the amount of help a user needs. *Does the content of email correspondence differ from the content of traditional letter correspondence?* Electronic technology has affected many facets of our daily lives. It has affected how we think about information and how we search for answers to our questions. *Have the types of questions asked by remote users become more specific and require less time to answer since users have access to the on-line catalog, Web pages, and search engines that can provide information?*

Remote access to information has encouraged students and researchers to think differently about how they do research. For some, the on-line system has become the place to do research rather than a research tool to be used in conjunction with other types of searches. *Has the level of scholarship of remote reference questions been affected by the availability and use of the Internet?*

Reference correspondence is a type of communication that involves both content (information) and a relationship (interaction) between the correspondent and the librarian.

The way in which the questions are asked and the information is provided affects the relationship between the user and the librarian. According to Fisher and Ellis (1994), cohesiveness and productivity are interrelated. It is important for there to be cohesion within a group in order for the group to be productive and accomplish its task.

The letters are a wealth of information about the interaction process. *In analyzing these letters, what types of supportive language is used by the reference librarian to encourage cohesion and allow users to express themselves and feel comfortable with the reference process? Are there steps that can be followed to promote cohesiveness between the reference librarian and the user in reference correspondence? Do both email and traditional letters contain the same types of interactions? Do they follow the same phases of group decision-making? Are there differences in the number of task and socio-emotional messages depending on the way the messages are communicated?*

These questions are complex and cannot be completely answered by this study. But, this analysis may give librarians greater insight into email reference service. The development of a profile of the remote users of the Duke University Reference Department's "Ask a Librarian" service, an analysis of the types of questions asked, and an evaluation of the interaction between librarians and correspondents, may allow academic librarians to better understand, from the users' point of view, the use of email reference service.

Methodology

In order to study a representative sample of the letters sent by traditional letter and by email, my plan was to select a simple random sampling of both types of letters. Statistics kept by the Reference Department showed there were 8400 email letters to Duke University's "Ask a Librarian" service from January 1999 to February 2003. Due to the way that some of the early letters were archived, only 6600 were actually accessible. There were approximately 4800 letters from July 1962 to December 1978 available for study. My plan was to select every tenth letter and every fifteenth email to get a sample size of approximately 8% of the total collection.

A unit of analysis for this study was defined as an email or a letter that elicits a response from a librarian. Since it was important that each piece of correspondence contain an inquiry and a response in order to be considered a mutual action, correspondence that did not have an identifiable response was set aside and the next acceptable letter, in chronological order, was selected. This type of sampling yielded a sample of letters from all librarians since responding to letters and email has historically been shared by all of the staff. Correspondence that did not ask a reference question was also removed. The term "correspondent" is used throughout this study to refer to the person who contacts the Reference Department by traditional letter or email to ask a reference question.

A pilot study was conducted to verify that the coding definitions were clear and could be applied. Two coders independently coded twenty-five letters and twenty-five emails to establish inter-coder reliability. Of the 1150 codes assigned in the pilot study, there was a coding difference of 1% between the two coders for the total number of codes. The differences were discussed and were used to amend the descriptions of the coding schema to reflect mutually agreed upon modifications to the original coding criteria.

My study coded correspondence on three distinct levels. The first level of inquiry was to determine the demographics of the people who corresponded with the Reference Department. The second level examined the content of the messages and the third level analyzed the interaction between the correspondent and the librarian. The results were then entered into the statistical analysis software SPSS and the data were analyzed using Pearson's chi-square test for independent samples.

Demographic Analysis

The coding for the demographic level was determined by the questions asked of the correspondent on the electronic "Ask a Librarian" form used for email reference correspondence. (See Appendix C for a copy of the "Ask a Librarian" form.) The correspondent's affiliation with Duke University was coded to show whether the correspondent was:

- Duke Faculty or Staff
- Duke Student
- Duke Alumnus

- Not Affiliated with Duke
- Unknown

On the "Ask a Librarian" form, it was assumed that correspondents truthfully answered the questions. In the letters, only if a correspondent mentioned their Duke affiliation could it be determined for this analysis.

The study also recorded the geographic location of the correspondent. For email, the line from the "Ask a Librarian" form that the correspondent used to indicate location and the address lines of the letters were used to determine this information. The location of the correspondent was coded into the following categories:

- On Campus
- Off-campus, But in NC
- In the US, But Not in NC
- Outside the US
- Unknown

The gender of the correspondent was also recorded to determine if the percent of men and women correspondents had changed with the advent of electronic mail, and if their interactions had changed. The determination of the gender was dependent on being able to make a decision based on the correspondent's first name. Unisex names were coded as "unknowns."

Content Analysis

On the second level, the messages were analyzed for content. My study used a schema developed by Grogan (1992) for categorizing reference questions. Grogan

identified eight types of questions that fall into two broad categories: limited help questions and open-ended questions. Limited help questions include:

- Administrative and directional inquiries: where things are located and how things are done in a particular institution;
- Author/title inquiries: holdings transactions; and
- Fact-finding enquiries: ready reference.

Questions as diverse as "How do I set up my computer as a proxy server," "I am looking for a poem called 'Sailing to Byzantium,"' and "What was the population of Durham, North Carolina in the year 1998" are all examples of limited help questions. Many of these questions can be answered by using the card catalog, the on-line catalog, or ready reference tools.

The pilot study revealed that the limited help category needed to be expanded to include questions about how to do specific on-line searches for information and also questions forwarded to someone else. Correspondence was either forwarded because a research specialist could better answer the question or because the email question did not come from a person affiliated with Duke or concern a Duke library.

Questions that are not self-limiting and demand more extended assistance from the reference librarian are called open-ended questions. Open-ended questions include:

- Material finding inquiries: questions that are subject or search queries;
- Mutable inquiries: questions that start as fact finding and become material finding inquiries;
- Research inquiries: questions that reveal the need for new knowledge;
- Residual inquiries: questions that have a logical flaw; and

- Unanswerable questions: questions whose answers are logically impossible, questions not practically able to be answered, or questions with no answer.

Each letter may include more than one inquiry. Each query was coded as to whether it was a limited help question or an open-ended question. Due to the nature of written inquiries, each letter may include more than one type of question. A unit of analysis that contained both open and limited questions was coded as an open question since the librarian had to give more extended assistance in order to complete the interaction. The advantage for study purposes of this coding was that it was based on the nature of the response required from the reference librarian.

Interaction Analysis

This study also examined the interaction that occurs between the correspondent and the reference librarian. I used a systematic method of coding interactive behavior developed by Robert Bales (1950) called "Interaction Process Analysis," described earlier. Interaction Process Analysis focused on categorizing communication by the type of interaction and then analyzing its social-emotional areas and task areas. As described in the literature review, Bales identified twelve categories with which to code and record the process of interaction.

In this study, each message was coded for the function of the message using Bales' Interaction Process Analysis. This process analysis was used to determine the function of the message and not the content of the correspondence. A message was coded only once for each one of Bales' categories it contained. So, a message could be

coded in all categories but it could not be coded twice in the same category. The messages were then compared by percentage to the total number of traditional letters or emails depending on its method of transmission.

The task and socio-emotional dimensions of the interactions were also tabulated. The task dimension refers to the work the user and the librarian are to perform. The socio-emotional dimension refers to the relationship between the user and the librarian and how they feel about one another. This analysis was used to describe the presence of a defined task and socio-emotional messages in email and traditional letter correspondence to see if format influences the functions of the messages used in written correspondence.

The pilot study revealed that the coding scheme used by Bales' Interaction Process Analysis needed some adjustment in order to be most useful for coding the interactions between correspondents by traditional letter and by email. Several categories needed specific clarification in order for their implementation to be consistent and to make them more applicable to the interactions that occur in correspondence. Changes were made to category 1 (gives solidarity), category 4 (gives suggestion), category 5 (gives opinion), and category 6 (gives orientation).

The pilot study also revealed the lack of disagreement (category 10), tension (category 11), and antagonism (category 12) in reference correspondence. As a result, these categories were eliminated. The absence of messages coded for disagreement, tension, and antagonism affected the usefulness of Bales' coding scheme for problem orientation. Instead, a variation of Bales and Strodtbeck's (1951) three-phase model is more appropriate to use to analyze the sequence of decision-making steps taken in

reference correspondence. As described by Ellis and Fisher (1994), these three phases include:

- An emphasis on orientation (description of the situation);
- An emphasis on evaluation (deciding what attitudes should be taken toward the situation); and
- An emphasis on control (deciding what to do about the situation).

Bales' coding scheme was adapted for this study of correspondence. (See Appendix D for a detailed summary of the coding scheme used in this analysis.)

Conclusions

The methods chosen for analyzing the letters sent by traditional mail and email will give a sketch of the profiles of the users, the content of the messages, and an analysis of the process of the inquiry. This combination of data will be analyzed to give a more complete picture of the user, the types of questions asked, and the way in which the user and the librarian interact in order to exchange information.

Results

A random sampling was conducted of traditional reference letters and emails kept by Duke University's Reference Department. The plan was to select every tenth letter from July 1962 to December 1978 and every fifteenth email from January 2000 to February 2003. The only criteria for selection were that there had to be a written response included with the letter of inquiry and the inquiry had to be a reference question. If a letter did not fulfill these requirements, the next acceptable letter in chronological order was selected. The number of traditional and email letters archived without responses and the number of non-reference correspondence reduced the sample size from original estimates. The final sample size consisted of 197 traditional letters and 196 email letters.

Demographics: Gender

A comparison between the type of correspondence used to send an inquiry to the Reference Department and the gender of the correspondent indicates a significant relationship between these two variables. First, males were almost twice as likely (63%) to write a letter as write an email (37%). Females were about evenly divided between whether they would write a traditional letter (47%) or write an email (53%). These comparisons of gender are specified in Table 1.

Table 1: Relationship of Gender and Type of Correspondence

Gender	Type of Correspondence		Total
	Traditional Letter	E-mail	
Male	106	62	168
% of Total	63%	37%	100%
Female	84	95	179
% of Total	47%	53%	100%

Unknowns removed and N of valid cases = 347.

It is true that there were more men than women in academia during the 1960s-1980s, so it is likely that there would be more men than women writing letters to a university reference department. The number of women writing letters is actually artificially high since a number of them were secretaries or librarians who were writing on behalf of someone else. Table 2 shows the relationship of type of correspondence and gender. This analysis of the preference by gender for type of correspondence reveals a strong male preference for writing traditional letters.

The preference for men to write letters is further reflected in an analysis of the total group of traditional letter writers. Of the traditional letter writers, males wrote 55.8% while females wrote 44.2% of the letters. The group of email writers shows a corresponding symmetry with 39.5% of the email written by males and 60.5% written by females. The reason for the difference is unclear. It may be true that men are more comfortable with a formal writing style and could prefer the stylized writing associated with business letters.

Table 2: Relationship of Type of Correspondence and Gender

Type of Correspondence	Gender		Total
	Male	Female	
Traditional Letter	106	84	190
% of Total	55.8%	44.2%	100%
Email	62	95	157
% of Total	39.5%	60.5%	100%
Total	168	179	347
% of Total	48.4%	51.6	100%

Pearson Chi-Square value of 9.144 with 1 df, significance at the .002 level; unknowns removed; and N of valid cases = 347.

Second, the percentage of women writing reference questions increased dramatically from 44.2% of the total number of traditional letters received, from 1962 to 1978, to 60.5% of the total number of emails received from 2000 to 2003. One reason that this may have occurred is because the number of women attending schools of higher education changed significantly between 1960 and 2000. According to education statistics, the number of women with four or more years of college education rose from 5.8% of the United States population in 1963 to 23.6% in March 2000. Many of the reference letters were written by people seeking information to use in their academic research. It may be that the number of women writing reference emails has increased due to this change in educational achievements. It may also be possible that women are more comfortable writing email reference questions than men. This hypothesis is beyond the scope of this study and is an area for further research.

One characteristic of traditional letter correspondence, that was not true of email, was the use of intermediaries for seeking information. A number of traditional letters were written by reference librarians seeking information for a patron or by a secretary asking for information for an employer. In many cases this intermediary was a woman.

As mentioned earlier, this increased the number of women who corresponded by letter. The advantage that email gives for information to be exchanged quickly has removed the need for an intermediary whose function is to type for someone else. This is one example of how the effects of email extend beyond the walls of the library and are indicative of changes throughout the service industry that have been brought about by the use of email.

This analysis does show that gender is a factor that needs to be considered in the context of understanding computer-mediated communication in reference service. Gender differences in format preferences, language, and interactions are revealed in the analysis of the data collected for both traditional letters and email.

Demographics: Affiliation

The next level of analysis used to understand the demographic characteristics of traditional letter and email correspondents was the stated affiliation that the correspondent had with Duke University. The affiliation of the people who corresponded by email can be analyzed. However, the number of traditional letter correspondents who mentioned their Duke University affiliation was so low (2.5%) that an analysis of the affiliation of the traditional letter writers cannot accurately be made.

Table 3: Affiliation of Email Correspondents

Type of Correspondence	Affiliation				
	Duke Faculty/Staff	Duke Student	Alumnus	Not Affiliated	Total
Email	35	54	12	93	194
% of Total	18.0%	27.8%	6.2%	48.0%	100%

Pearson Chi-Square value of 11.384 with 3 df, significance at the .01 level; unknowns removed; and N of valid cases = 194.

In looking at email, it is significant that of 194 email letters, 48% were from people who were not affiliated with Duke University. This percentage shows that a person's lack of affiliation is not a barrier to access. Duke University (2003) has a disclaimer on its "Ask a Librarian" Web page that states:

> We regret that we can only answer reference questions from members of the Duke community or questions about Duke University and its library collections. If you are not affiliated with Duke, please contact your local public library or use the Internet Public Library [http://www.ipl.org/div/askus/].

Instead of refusing to help, the reference librarian who responds to an "Ask a Librarian" inquiry from a non-affiliated correspondent will often use this disclaimer and also make some suggestions about how or where the user may search for information that does not involve the use of Duke University resources. It is clear that the "Ask a Librarian" Web page attracts the attention of many people not affiliated with the university who are browsing the Web for assistance or amusement. This disclaimer does not deter users when they submit their questions, nor is this disclaimer used as an actual refusal to give reference assistance.

The data shows that more Duke students than faculty or staff use the "Ask a Librarian" service. This difference may indicate that students are more comfortable than faculty or staff with using email as a way to communicate. This may be a factor of age and level of comfort with computer use. As older members of the academic community become more acclimated to the use of computers or retire and are replaced by younger colleagues, it would be interesting to see if this number increases. This statistic may also be indicative of the proportion of faculty that uses the library. Dougherty and Dougherty (1993) summarized existing literature and concluded that libraries are not a primary source of information for many faculty. Faculty may use other methods to obtain the

information they need in order to do their work. For example, they may send teaching assistants to the library to retrieve books or articles they need for their classes or their research.

Only 6.2% of the emails received were from alumni. The relatively low number of alumni who make use of the "Ask a Librarian" assistance may point to a lack of knowledge about the service. This is an area where promotion and advertising would be warranted so as to increase participation. According to licensing agreements, alumni do not qualify for access to university databases but other aspects of the library's collection are available and access to them through the reference librarian could be useful. This service would be of assistance to alumni and would help maintain a positive connection between the university and its graduates.

Demographics: Location

A comparison between the location of the correspondents and the way they correspond with their reference questions reveals that the total percent of people who were on campus and wrote the Reference Department was 1.8% for those who wrote by traditional letter and 98.2% for those who wrote by email. In the era of traditional letter writing, people who lived or worked on campus did not choose to write letters to the department. Assuming that the need for on campus reference assistance has remained constant, this would lead to the conclusion that students and faculty, before the use of email, chose to pose their questions face-to-face with a librarian or by telephone.

The number of correspondents who lived or worked off-campus, but were in North Carolina, remained somewhat constant. Table 4 shows that the number of

traditional letters writers was 43.7% and the number of email writers was 56.3%. The number of correspondents who lived or worked outside the United States also remained reasonably constant. The number of traditional letters writers was 51.3% and the number of email writers was 48.7%. The following table gives the numbers and percentages for all locations by type of correspondence.

Table 4: Relationship of Type of Correspondence and Location

Location	Type of Correspondence		Total
	Traditional Letter	Email	
On campus	1	55	56
% of Total	1.8%	98.2%	100.0%
Off-campus, in NC	31	40	71
% of Total	43.7%	56.3%	100.0%
In US, but not in NC	143	74	217
% of Total	65.9%	34.1%	100.0%
Not in US	20	19	39
% of Total	51.3%	48.7%	100.0%
Total	195	188	383
% of Total	50.9%	49.1%	100.0%

Pearson Chi-Square value of 75.075 with 3 df, significance at the <.0001 level; unknowns removed; and N of valid cases = 383.

There was a dramatic shift between traditional letter correspondents and email correspondents who were in the United States, but not in North Carolina. Comparisons show that 65.9% of the correspondence from this location came by letter while 34.1% came by email. Before the use of email, it may be that the cost of interstate long distance telephone calls encouraged people outside of North Carolina to write letters to the Reference Department.

It is interesting to note that the number of email inquiries from people who are off-campus, and in North Carolina, is lower than either the number from on campus or the number from within the United States, but not in North Carolina. The high number of inquiries from out-of-state reflects that Duke University has a strong national reputation. However, Duke University's close proximity to a number of other in-state academic libraries that also offer email reference services to North Carolina residents may also be a factor in the relatively small number of off-campus, in-state inquiries. In addition, many in-state residents have a strong affiliation with the University of North Carolina system and may prefer to send their questions to one of the public universities.

Table 5: Relationship of Location and Type of Correspondence

Type of Correspondence	Location of Correspondent				
	On campus	Off-campus, in NC	In US, but not in NC	Not in US	Total
Email	55	40	74	19	188
% of Total	29.2%	21.3%	39.4%	10.1%	100%
Letters	1	31	143	20	195
% of Total	.5%	15.9%	73.3%	10.3%	100%

Pearson Chi-Square value of 75.075 with 3 df, significance at the <.0001 level; unknowns removed; and N of valid cases = 383.

Content

Grogan's definitions of "open" and "limited help" questions were used to determine the content of the reference questions. Questions that could be quickly answered by using the card catalog, the on-line catalog, or ready reference tools were coded as limited help questions. Questions that were not self-limiting and demanded

more extended assistance from the reference librarian were coded as open questions. The data reveals a significant difference between the content of questions asked by traditional letter and those asked by email. Table 6 shows that of the open questions, 62.3% came by traditional letter while 37.7% came by email. These statistics reverse themselves for limited help questions as 35.9% came by letter and 64.1% came by email.

Table 6: Relationship of Content and Type of Correspondence

Content	Type of Correspondence		Total
	Traditional Letter	Email	
Open	132	80	212
% of Total	62.3%	37.7%	100.0%
Limited	65	116	181
% of Total	35.9%	64.1%	100.0%
Total	195	196	393
% of Total	49.9%	50.1%	100.0%

Pearson Chi-Square of 27.123 with 1df, significance at the <.0001 level; and N of valid cases = 393.

This shift has significant implications for academic reference departments. Many of the limited help questions asked by email require the use of the on-line catalog, the library's reference pages, and ready reference tools. The development of an easily accessible collection of ready reference books, the creation of Web resources, and a database of answers to frequently asked questions makes the librarian's job of answering email questions much quicker. It may also indicate that today email is most effectively used to answer limited questions and a face-to-face interview may be needed to encourage a user's critical thinking and deeper exploration of resources.

The shift to an increasing number of limited help questions raises issues that warrant further study. Does the increase in the number of limited help questions and the

decrease in the number of open questions indicate a change in the overall level of scholarship at the university or have face-to-face research consultations replaced correspondence as a way to ask in-depth questions of reference librarians? Are the questions posed to by email to academic reference librarians becoming more similar to those posed to public librarians?

An analysis of the relationship of content and affiliation is primarily an examination of the content of email questions since only 2.5% of the traditional letter writers identified their affiliation. Table 7 shows this analysis. Duke faculty and staff, Duke students, and Duke alumni asked more limited help questions by email than open-ended questions. These groups do not use email as the way to ask in-depth questions of the reference staff. It may be that they set up research consultation with librarians, visit the reference desk in person to ask more open-ended questions, or use other methods to do research.

Table 7: Relationship of Content and Affiliation

Content	Location				
	Duke Faculty/Staff	Duke Student	Duke Alumnus	Not Affiliated	Total
Open	8	17	6	51	83
% of Total	9.8%	20.7%	7.3%	62.2%	100.0%
Limited	29	37	8	43	117
% of Total	24.8%	31.6%	6.8%	36.8%	100.0%
Total	37	54	14	94	200
% of Total	18.6%	27.1%	7.0%	47.2%	100.0%

Pearson Chi-Square of 14.588 with 3df, significance at the .002 level; unknowns removed; and N of valid cases = 200.

People who are not affiliated with Duke University are more likely to use email to ask open questions than limited help questions. This may indicate that people browsing the Web have few resources or skills to use to find answers to their questions, they may be looking for a quick and inexpensive way to do research, or the convenience of the email service attracts users with broad interests who have not narrowed their questions.

The comparison of content to location, shown in Table 8, indicates a similar trend. Correspondents who are in the United States, but not in North Carolina, account for 56.7% of the total correspondence. Of these, 63.5% are open questions and 48.9% are limited questions. Questions from people in North Carolina are more likely to be limited rather than open questions.

Table 8: Relationship of Content and Location

Content	Location				
	On Campus	Off-campus, But in NC	Off-campus, Not in NC	Not in US	Total
Open	17	32	129	25	203
% of Total	8.4%	15.8%	63.5%	12.3%	100.0%
Limited	39	39	88	14	180
% of Total	21.7%	21.7%	48.9%	7.8%	100.0%
Total	56	71	217	39	383
% of Total	14.6%	18.5%	56.7%	10.2%	100.0%

Pearson Chi-Square of 18.869 with 3df, significance at the <.0001 level; unknowns removed; and N of valid cases = 383.

Questions that are from correspondents outside of North Carolina tend to be open-ended rather than limited. Correspondents who are within North Carolina are more likely to ask questions that deal with Duke University's holdings, are concerned with where

things are located or how something is done at Duke, or are fact-finding inquiries. Questions from outside of North Carolina are more likely to demand more extended assistance from a reference librarian in order to be answered.

Interaction Process Analysis

The analysis of the interactions between the correspondent and the reference librarian focused on identifying any significant differences between traditional letters and email, with an emphasis on the intention of the communication. There were four levels of analysis. First, the messages were analyzed by coding them into the nine categories adapted from Bales' Interaction Process Analysis. Second, the analysis compared the variables of gender, location, affiliation, and content to the nine categories to see if there were any patterns within the interactions. Third, the categories were then grouped by problem orientation so as to code the process of the reference inquiry and fourth, the messages were categorized by socio-emotional or task orientation to determine the function of the communication.

For the interaction process analysis, a unit was defined as a letter or email that elicited a response from a librarian. The letter of inquiry and the response were coded as one unit. Each unit contained multiple messages and could be coded for multiple functions within Bales' scheme but a message could be coded only once for each function. Theoretically, a unit could be coded in all categories but it could not be coded twice in the same category. The functions of the messages in this study are shown in Table 9.

The methods of correspondence are strikingly similar when they are broken down on this level. The categories for showing solidarity (traditional letter: 89.8%; email 84.7%), giving orientation or information (traditional letters: 97%; email 95.4%), giving suggestion or direction (traditional letters: 48.2%; email 46.9%), and asking for orientation or information (traditional letters: 94.4%; email 95.4%) are particularly similar. Only two categories show a percentage difference of more than 6%. They are: category #9 that codes messages that ask for suggestion or direction (traditional letters: 16.2%; email: 9.7%) and category #5 that codes messages that give opinion or express feeling.

Table 9: Interaction Analysis

Code #	Function	Traditional Letter Percentage	Email Percentage
1	Shows solidarity	89.8%	84.7%
2	Shows tension release, jokes, laughs, shows satisfaction	1.5%	.5%
3	Agrees, shows passive acceptance, understands	.5%	1.5%
4	Gives suggestion, direction	48.2%	46.9%
5	Gives opinion, evaluation, analysis; expresses feeling	42.6%	35.7%
6	Gives orientation, information, repeats, clarifies, confirms	97%	95.4%
7	Asks for orientation, information, repetition	94.4%	95.4%
8	Asks for opinion, evaluation, analysis, expression of feeling	0%	.05%
9	Asks for suggestion, direction, possible ways of action	16.2%	9.7%

Earlier research on gendered language has shown that males and females tend to have different characteristic on-line styles of communication. Herring (1994) concluded that women tend to be more supportive and ask for personal orientation while men tend to be more adversarial in their interactions. Thomson and Murachver (2001) examined gender differences in language used in emails sent by people to others of the same sex. They concluded that women are more likely to ask more questions, ask for more suggestions, and give more compliments. Although the sample size in this analysis is small, the results are consistent with these studies. The relationship between the gender of the correspondents and those who ask for some type of suggestion is shown in Table 10. Women were approximately twice as likely as men to ask for a suggestion as part of their correspondence, 17.3% of women and 8.9% of men asked for a suggestion in their correspondence.

Table 10: Relationship of Gender of Correspondents and Bales' Category #9: Asks for Suggestion

Gender	Type of Interaction		Total
	Other Categories	Asks for Suggestion	
Female	148	31	179
% of Total	82.7%	17.3%	100.0%
Male	153	15	168
% of Total	91.9%	8.9%	100.0%
Total	301	46	347
% of Total	86.7%	13.3%	100.0%

Pearson Chi-Square of 5.305 with 1df, significance at the .021 level; unknowns removed; and N of valid cases = 347.

The similarities between how correspondents asked for assistance and how librarians provided assistance for both traditional letters and emails showed that the meaning of many interactions has not changed with format. Fisher and Ellis (1994)

pointed out that building a supportive environment is one of the best ways to encourage cohesion in a group. The use of supportive communication occurs when group members respect and encourage one another. The interactions that are coded for Bales' category #1, shows solidarity, are clear examples of communication that develop a supportive relationship between the correspondent and the librarian. The high percentage, 89.8% for traditional letters and 84.7% for email, shows that correspondence in either format tends to contain words of solidarity.

The similarities and differences of how goodwill was established and the compliments and gratitude exchanged within the content of traditional letters and emails are note worthy. The email correspondent often included a brief thank you at the end of their inquiry. The use of an exclamation point after the thank you was a prevalent use of punctuation. In the traditional letters, a thank you from the correspondent was also common but the wording was more formal and more descriptive. The following quotes are typical examples. "Any help you could render I would greatly appreciate" (September 17, 1965). "Please accept my thanks in advance for your able assistance" (March 10, 1966). "Thanking you for your attention to this small inquiry" (August 19, 1973). Exclamation points after the words of goodwill were never used.

It was usually the initial correspondence from the traditional letter or email writer who would use words to create a feeling of solidarity. The librarian, in both formats, would often provide the information requested in a matter of fact style. In emails, a number of librarians did thank the correspondent for contacting Perkins Library, especially if the correspondent had some affiliation with Duke University. "Thank you for contacting Perkins Library" (November 23, 2002). The librarians who responded to

traditional letters did not thank the correspondent for contacting the library, but in a number of cases they would offer further assistance. Again, the wording used was more descriptive. "I am indeed sorry that our search had no better results. If we can ever assist you again, please let us know" (February 2. 1973). "I hope that we have been of some assistance in the preparation of your manuscript" (August 31, 1973). In a response to another librarian, "Please forward to your patron our best wishes for the success of her/his research" (April 7, 1976). All of these examples show that the intentions of the writers of reference correspondence are similar despite the difference in format but the language used to create a supportive environment has definitely changed.

The high percentages of people who write to the reference department and ask for orientation or information and the high percentages of those who are given orientation are not surprising. The intent of reference service is to provide assistance to people and the question is the stimulus for this interaction.

The difference in percentages for those correspondents who asked for a suggestion or direction, 16.2% for traditional letters and 9.7% for email letters, may indicate a difference between the email correspondent's perception of the accessibility of information and that of a traditional letter writer. Traditional letter writers were more likely than email writers to use the library's reference service as one step in a linear search to find information. Email writers may believe that a librarian has the ability to find a satisfactory answer.

Relationships Between Categories of Interaction

There is a significant relationship between those messages that show solidarity and those that give orientation. Comparisons, shown in Table 11, revealed that 98.3% of the messages that give orientation (provide information, repetition, clarification, or confirmation) also show solidarity (raise others' status, provide help or rewards). This development of supportive communication helps to create an environment of trust and respect between the correspondent and the librarian. The exchange of information coupled with a feeling of solidarity makes the interaction more personal and creates a feeling of cohesion that tends to make the process more productive.

Table 11: Relationship of Bales' Category #1: Shows Solidarity and Bales' Category #6: Gives Orientation

Type of Interaction	Type of Interaction		Total
	Other Categories	Gives Orientation	
Other	8	41	49
% of Total	16.3%	83.7%	100.0%
Gives Solidarity	6	338	344
% of Total	1.7%	98.3%	100.0%
Total	14	379	393
% of Total	3.6%	96.4%	100.0%

Pearson Chi-Square of 26.548 with 1df, significance at <.0001 level; and N of valid cases = 393.

Table 12 shows the relationship between asking and being given some form of orientation. It cannot be assumed that the correspondent received the answer to their request but 96% of the interactions that included a request for orientation also provided orientation. This rather obvious and expected result indicates that the reference correspondence process functions and information is exchanged. The quality of service provided would be the scope of further research.

Table 12: Relationship of Bales' Category #6: Gives Orientation and Bales' Category #7: Asks for Orientation

Type of Interaction	Type of Interaction		Total
	Other Categories	Asks for Orientation	
Other	4	10	14
% of Total	28.6%	71.4%	100.0%
Gives Orientation	15	364	379
% of Total	4.0%	96.0%	100.0%
Total	19	374	393
% of Total	4.8%	95.2%	100.0%

Pearson Chi-Square of 17.778 with 1df, a significance at <.0001 level; and N of valid cases = 393.

By contrast, the relationship between those messages that ask for suggestions and those that give suggestions reveals the opposite response. Table 13 shows that only 17% of the messages that ask for a suggestion receive a suggestion. Librarians may perceive this type of request as a request for orientation, instead of a desire for a suggestion. This analysis is further supported by the data given in Table 14 that shows the relationship between messages that ask for orientation and those that ask for a suggestion. Only 11% of the messages that asked for orientation also asked for a suggestion. Correspondents tend to approach a reference service with a question and want to be given orientation or information rather than a suggestion. This is true for both open-ended questions and for limited help questions.

Table 13: Relationship of Bales' Category #4: Gives Suggestion and Bales' Category #9: Asks for Suggestion

Type of Interaction	Type of Interaction		Total
	Other Categories	Asks for Suggestion	
Other	186	19	205
% of Total	90.7%	9.3%	100.0%
Gives Suggestion	156	32	188
% of Total	83.0%	17.0%	100.0%
Total	342	51	393
% of Total	87.0%	13.0%	100.0%

Pearson Chi-Square of 5.220 with 1df, significance at the .022 level; and N of valid cases = 393.

Table 14: Relationship of Bales' Category #7: Asks for Orientation and Bales' Category #9: Asks for Suggestion

Type of Interaction	Type of Interaction		Total
	Other Categories	Asks for Suggestion	
Other	9	10	19
% of Total	47.4%	52.6%	100.0%
Asks for Orientation	333	41	374
% of Total	89.0%	11.0%	100.0%
Total	342	51	393
% of Total	87.0%	13.0%	100.0%

Pearson Chi-Square of 27.800 with 1df, significance at <.0001 level; and N of valid cases = 393.

Problem Orientation

The differences between the problem orientation of messages sent by traditional letters and email are a matter of degree and do not show a change in emphasis dependent on their format. Both traditional letters and email have a high percentage of messages that focused on orientation. Table 15 shows that 49% of the traditional letter writers and 51.5% of the email writers used an orientation message in their correspondence. An orientation message included either the asking or giving of information, repetition, clarification, or confirmation. The traditional letter messages focused more on evaluation

(asking or giving opinion), control (asking or giving suggestion), and integration (showing solidarity) than the email messages but again the comparisons are one of degree rather than difference. This indicates that the process of how a correspondent and a reference librarian approach and deal with a reference question has not changed significantly with the use of email.

Table 15: Correspondence Grouped by Problem Orientation

	Traditional Letter		Email	
Problem Orientation	Total #	Percentage	Total #	Percentage
Orientation	377	49.0	374	51.5
Evaluation	84	10.9	71	9.8
Control	127	16.5	111	15.3
Decision	1	0.1	3	0.4
Tension-Management	3	0.4	1	0.1
Integration	177	23.0	166	22.9

Notes: Orientation: categories 6 & 7, Evaluation: categories 5 & 8, Control: categories 4 & 9, Decision: categories 3 & 10, Tension-Management: categories 2 & 11, Integration: categories 1 & 12.

The Function of Messages

The differences between the function of the messages of traditional letters and email are also a matter of degree rather than a significant change. Table 16 shows that both formats have 100% orientation to task while 91.8% of traditional letters and 85.2% of email contain socio-emotional messages. Neither group contained any negative socio-emotional messages.

The criteria mentioned earlier that is indicative of positive group interaction consists of: a feeling of inclusion; messages that include orientation so the interactions stay focused; feedback between group members; motivation to contribute to the group; and a feeling of comfort with the hierarchy or roles of its members. The analysis of the

function of the messages in reference correspondence indicates the presence of these factors. Reference question tasks tend to be defined, positive feedback occurs, and there are clear roles for the group members. The depth of these messages was not analyzed in this study but their occurrence indicates that the written reference process contains the elements needed for both members of the group to be satisfied with the interaction.

Table 16: Correspondence Grouped by Function of Message

	Traditional Letter		Email	
Function	Total #	Percentage	Total #	Percentage
Socio-emotional	179	91.8%	167	85.2%
Positive	179	91.8%	167	85.2%
Negative	0	0%	0	0%
Task	195	100.0%	196	100.0%
Questions	195	100.0%	193	98.5%
Answers	195	100.0%	196	100.0%

Notes: Socio-emotional messages: categories 1-3, 10-12, positive messages: categories 1-3, negative messages: categories 10-12; Task messages: categories 4-9, question messages: categories 7-9, answer messages: categories 4-6.

Other Observations

The physical attributes of the traditional letters added to the character of the correspondence. The Reference Department received letters and postcards on all types of paper. Most were typed but some were handwritten. The handwritten ones were always in cursive and none were illegible. A few were even illustrated. The type of paper used was of great variety, from notebook paper to onionskin typing paper to card stock. The contrast between the consistency of the format of the emails and the variety of the traditional letters was startling. The homogeneity of the emails puts the focus of the correspondence solely on the question being asked. The divulgence of any other

information was left to the written discretion of the correspondent. The appearance of the traditional letter was more reflective of the personality of the correspondent.

The content of written reference correspondence was analyzed based on whether the inquiries were open or limited help questions. Although the subjects of the inquiries were not analyzed, one difference was noted in the types of questions asked by traditional letter and by email. In traditional letter correspondence, 10.3% of the inquiries concerned genealogy while 0% of the email contained genealogy questions. Today, the Rare Book, Manuscripts, and Special Collections Library at Duke University receives many written inquiries related to family history research. This specialization within the library has affected the focus of the work of the Reference Department and also affects the types of questions.

A change in the length and the depth of the correspondence was observed between traditional letter and email communication. Traditional letters tended to be at least one typed or handwritten page long while emails tended to be only one paragraph long and, in some instances, only one sentence long. The percent of orientation information provided by messages in both formats was comparable, 97% of traditional letters and 94.5% of emails, but the amount of information provided in traditional letters was longer and more in-depth than the information given in emails.

Conclusions

Email has affected academic reference service in significant ways. Email allows information to be quickly transferred from one person to another. It offers the opportunity for a reference librarian to conduct a reference interview in ways not possible in a traditional letter. Email has reduced barriers and made reference service more available. Computers have changed how people do research, as there are more ways and places to search for information. Email is a tool that offers many possibilities for improving reference service. An increased understanding of how email affects communication will allow librarians to take advantage of its potential and better serve their users.

Email service at Duke University has affected the demographics of correspondents of the Reference Department. This analysis shows that the use of email has influenced the gender, location, and affiliation statistics of correspondents. Women are more likely than men to write emails, while men were more likely to write traditional letters. Email makes reference service readily available to people who are not affiliated with Duke University. It is clear that Duke's "Ask a Librarian" Web page attracts the attention of many people who are browsing the Web. A person's lack of affiliation is not a barrier to access to information. Email has also affected where correspondents are located. The majority of traditional letters came from outside North Carolina. Today, the number of users of email from within North Carolina has increased while the number outside of North Carolina has decreased.

Email has brought a significant difference in the content of the questions asked in reference correspondence. Email questions tend to be ones that can be quickly answered using ready reference tools or the on-line catalog. Questions asked in traditional letters tended to demand more extended assistance from reference librarians.

The patterns of behavior observed in traditional letter and email reference correspondence show that the types of interactions have not changed significantly with the use of email reference. The function of the individual messages, the process of how a correspondent and a reference librarian approach and deal with a reference question, and the presence of task and socio-emotional messages are statistically comparable. It is interesting to note that in almost all instances, the percentage for types of interaction is higher for traditional letters than the percentage for email correspondence. There have been changes in the occurrence of the interactions but the changes are a matter of degree rather than a significant shift.

The traditional letters and email letters reveal the same patterns of helping. In order to create positive interactions, correspondents and librarians tend to follow these steps:

Phase 1: The emphasis is on solidarity (creation of supportive communication). This occurs at the beginning and/or at the end of the interactions.

Phase 2: The emphasis is on orientation (description of the situation).

Phase 3: The emphasis is on evaluation (what attitudes should be taken toward the situation).

Phase 4: The emphasis is on control (deciding what to do about the situation).

The implementation of this cyclical approach to decision-making allows the correspondent and the reference librarian to make decisions and effectively perform tasks, in order to answer reference inquiries.

Academic institutions should expect increased demands for remote reference assistance. The number of emails has increased dramatically over the past few years and will continue to increase as people become more and more computer literate. This analysis reveals that academic libraries may prepare for this trend by implementing the following suggestions:

- Creating good ready reference collections. The easy accessibility of often used print and electronic resources will save staff time as they answer the increasing number of limited help questions.
- Developing Web pages to target answers to frequently asked questions. This will also save staff time and will encourage the education of Web users.
- Creating an effective email form that encourages correspondents to give pertinent information. At a minimum, this includes name, location, affiliation, inquiry, and background information that puts the request in context.
- Promoting electronic reference services to encourage their use by students, staff, faculty, and alumni. With increasing tuition costs, this will make better use of university resources and increase user satisfaction.
- Training staff to use patterns of behavior that will encourage supportive communication.

- Encouraging students, staff, faculty, and alumni to use research consultations with reference librarians to pursue more in-depth research topics. Email can effectively be used to answer limited help questions and open-ended questions with a limited scope.

It is important to remember that email correspondence is an interaction between the correspondent and the reference librarian. User satisfaction will determine the success of a remote reference service. Only librarians can create an email service where people can ask questions, be treated with respect, and be given access to information with the use of appropriate technologies and resources. This is the challenge and the opportunity for academic librarians to build on the understanding and wisdom of the past in order to make public service more effective.

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Appendix A: Coding of Email Questions at Academic Libraries

Name of Researcher	**Coding of Questions**
Bristow and Buechley (1995)	Coding is vague. "Most every type of reference inquiry is represented."
Bushallow, DeVinney, and Whitcomb (1996)	1. Basic reference 2. Library policy 3. OPAC questions 4. Purchase requests
Schilling-Eccles and Horzbecker (1998)	A few types of messages were noted but no clear coding categories given by the researchers.
Lederer (2001)	19 different categories; each question could fit in up to 3 categories. 1. Reference 2. Library related 3. Library dept. 4. University related 5. Bibliographic citation 6. Loan/reserve 7. In depth 8. Library catalog 9. Dissertation found here 10. Own dissertation 11. PIN # 12. Interlibrary loan 13. Refer out of library 14. Access to databases 15. WWW 16. Referral to other librarian 17. Selling own book 18. Donation 19. Empty (no question)

Appendix B: Coding of the Content of Reference Questions

Name of Researcher	Coding of Questions
Bearman (1989/90)	1. Questions that could not be answered by an information retrieval system 2. Procedural questions 3. Search-based questions
Bates, Wilde, and Siegfried (1993),	1. Names of individuals 2. Time 3. Geographical Names 4. Dates
Gagnon-Arguin (1998)	1. General subject 2. Specific subject 3. Specific form questions
Collins (1998)	1. Subject 2. Place 3. Time 4. Visual characteristics 5. Emotional or subjective qualities 6. Other requirements
Duff and Johnson (2001)	1. Type of request 2. Type of information desired 3. Type of information already known
Grogan (1992)	1. Limited help questions a. Administrative b. Author/Title c. Fact-finding 2. Open-ended questions a. Material finding b. Mutual questions c. Research inquiries d. Residual inquiries e. Unanswerable questions
Martin (2001)	1.Purpose of letter 2. Type of requests 3. Object of inquiry 4. Response 5. Question formality

Appendix C: "AskRef" Form, http://www.lib.duke.edu/reference/refq.htm#he

Email A Question

The Reference librarians check for electronically-submitted questions several times a day. Can't use forms? E-mail us at askref@duke.edu.

We regret that we can only answer reference questions from members of the Duke community **or** questions about Duke University and its library collections. If you are not affiliated with Duke, please contact your local public library or use the Internet Public Library [http://www.ipl.org/div/askus/].

Name:

Email address:

Phone number: (optional)

Duke Affiliation:

- **Duke faculty or staff**
- **Duke student**
- **Duke alumnus**
- **Not affiliated with Duke**

Location:

- **On campus**
- **Off-campus but in NC (home, Marine Lab, etc.)**
- **Off-campus but in the United States**
- **Off-campus and overseas**

Ask your Question:

Please be as specific as possible.

Submit question

Appendix D: Coding Scheme for Interactions in Reference Correspondence

1. Shows solidarity
    a. Initial and responsive acts of active solidarity and affection: goodwill, greeting. Does not include the use of traditional salutations and closings.
    b. Status-raising acts: praising, compliment, gratitude
    c. Response (to category 11): offers assistance to the other
    d. Response (to category 10 or 12): acts of pacification, compromise

2. Shows tension release, jokes, laughs, shows satisfaction
    a. Spontaneous indications of relief
    b. Joking

3. Agrees, shows passive acceptance, understands, concurs, complies
    a. Response (to category 1 or 2): any indication that actor is modest, humble, and unassertive
    b. Confirmation by repetition
    c. Response (to category 4): concurrence in a proposed course of action
    d. Response (to category 5): agreement with observation
    e. Response (to category 6): gives sign of recognition

4. Gives suggestion, direction, implying autonomy for other:
    a. Cooperative action: all acts which suggest concrete ways of attaining a desired goal; proposing a solution
    b. A desired action is proposed
    c. Gives alternative strategies if information provided is not enough or person not affiliated with Duke University

5. Gives opinion, evaluation, analysis; expresses feeling, wish:
    a. Includes all indications of thoughts leading to an understanding, such as reasoning, calculating, insight, musing. Includes expression of desire, want, liking, wishing, or hoping
    b. Attempts to understand one's motivation
    c. Attempts to understand the other's motivation
    d. Statements about the nature of a situation facing the group, which are not immediately observable
    e. Gives opinion of attempts to find information
    f. Gives opinion about when to expect answer from another department

6. Gives orientation, information, repeats, clarifies, confirms:
    a. All acts intended to secure or focus the attention of the other. Includes reflective looking back on past activity
    b. Actor reports without inference or tells about some past thought, feeling, action, or experience
    c. Shows understanding of the other or something the other has said

d. Includes statements of fact about the nature of the situation facing the group – straightforward, non-emotional; includes factual information
e. Forwards message to another person or department

7. Asks for orientation, information, repetition, and confirmation:
   a. Acts which indicate a lack of knowledge to support action: confusion about one's understanding, the meaning of a word
   b. Asks a direct or outright question for factual information

8. Asks for opinion, evaluation, analysis, expression of feeling:
   a. Includes open-ended, non-directive leads and questions aimed at exploration of the other's feelings, values, intention, and indications
   b. Asks for interpretation, diagnosis, or opinion on some topic.

9. Asks for suggestion:
   a. Requests direction
   b. Asks for possible ways of action